Using Streambox ACT-L3 over BGAN

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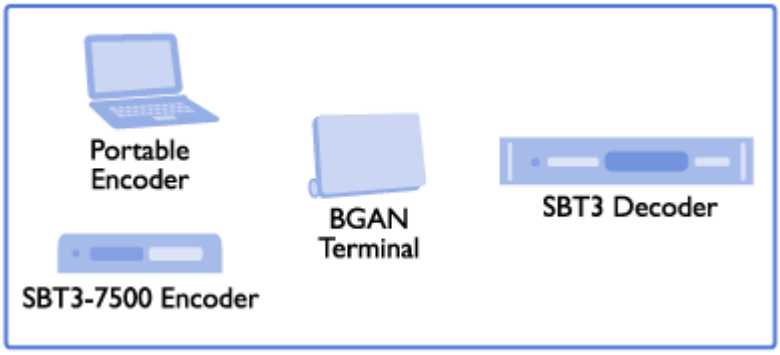


Overview

The Streambox® ACT-L3™ News Gathering solution has been specifically developed to meet the performance, compression, and quality requirements of broadcasters, government agencies, and enterprises worldwide. The robust family of Streambox ACT-L3 News Gathering solutions provides unrivaled video compression and quality at low data rates and low latency. Streambox ACT-L3 enables you to deliver live or stored video on demand.

Product range

The complete News Gathering solution from Streambox is comprised of the following:

- **Streambox Portable Encoder(s):**
  - **Streambox® Portable Encoder (laptop format)**
    The powerful Streambox Portable Encoder is Mac or Windows compatible, and facilitates high compression, high quality video transport over low data rate networks, all in real-time. You connect a DV camera to the Portable Encoder via a firewire (IEEE 1394) cable, and can set up and use the Encoder within minutes. It enables you to gather, edit, and transmit live video from the field via BGAN, IP or wireless networks.
  - **Streambox SBT3-7500 Encoder**
    The full-featured compact Streambox SBT3-7500 Encoder includes all the features of Streambox's rackmount systems in a much smaller form factor and with a lower power requirement: the Encoder can be powered by a car battery. It is highly portable and includes SDI and composite analogue video input. The Encoder is typically be used for real-time video transmission and for providing on-site edited news clips.
- **Streambox Distribution Server(s)**
  The Streambox Distribution Server manages, automates, and groups Encoders and Decoders for optimized video distribution and supports hundreds of video streams. It converts unicast streams to multicast streams, and features an easy to use web interface.
- **Streambox SBT3-5100 and SBT3-7100 Decoder(s)**
  The Streambox® SBT3-5100 and SBT3-7100 Decoders provide best-of-class performance and reliability with advanced networking features such as robust forward error correction and burst error protection. The Decoders provide adjustable latency settings for broadcasting or video

conferencing. The SBT3-7100 Decoder provides dual networking for Ethernet or T1/E1 and up to six channels of embedded SDI or AES audio.

- **Streambox IFB Server and Streambox® IFB Client(s)**
  The Streambox IFB Server and Streambox IFB Client feature six channels of balanced audio with strong encryption for secure audio delivery. They support USB and Bluetooth clients and provide a real-time talkback channel between the newsroom and the field reporter. An intuitive graphic user interface for Mac or Windows clients is included.

Typical Users

- Broadcasters.
- Government agencies, including military.
- Disaster relief organizations.
- Enterprises.

Key Features

The Streambox ACT-L3 News Gathering solution offers these key features:

- Unrivalled video compression and quality at low data rates.
- Best-of-class performance and reliability with advanced networking features.
- Advanced forward error correction and burst error protection.
- 4:2:0 and 4:2:2 colour profiles.
- Dual Ethernet.
- Multi-channel audio.
- Adjustable latency for video conferencing or broadcasting.
- Seamless local or remote system management.
- Optional store and forward feature, for enhanced video storage, management, and transmission.
- User configurable presets for quick and flexible setup.
- Optional in-car power adapter.

Benefits to BGAN users

The Streambox ACT-L3 News Gathering solution provides these main benefits:

- Proven performance with BGAN terminals.
- Real-time broadcast video over BGAN and IP networks.
- Low end-to-end latency.
- Integrated solution.
- Cost-effective news gathering and video conferencing.
- Built-in BGAN presets.

Setting up

To get the highest quality from live streaming, Inmarsat recommends that you use a dedicated streaming IP connection directly from the distribution partner to your Headquarters/Global Network. Inmarsat only guarantees BGAN streaming connections up to the Distribution Partners' point of presence (POP). There is no control of quality if the stream is routed over the public Internet.

For the highest quality video, use the 256kbps streaming IP connection, offered on both the HNS 9201 and the Thrane & Thrane EXPLORER 700 terminals.

Inmarsat recommends that you use BGAN LaunchPad for interfacing with the terminal of your choice.

Equipment Needed

- Streambox Portable Encoder (MAC or Windows compatible), or Streambox STB3-7500 Encoder.
- DV camera for Portable Encoder, or Analogue/SDI camera for STB3-7500 Encoder.
- BGAN terminal.

- Streambox STB3-5100 or Streambox STB3-7100 Decoder.
- Optional components:
    - Streambox Distribution Server.
    - Streambox IFB Server.
    - Streambox Store and Forward

Setting up the client for Live broadcast

To set up the client for live broadcast:

1. Install BGAN LaunchPad on the Streambox Encoder.
2. Launch the Streambox Encoder. Streambox video transport solutions enable you to customize settings. This optimises live video streaming over the BGAN streaming class service. The recommended settings are usually preloaded as 'Presets' on the Streambox Encoder.
3. The chart below lists the recommended settings for optimal quality over the BGAN streaming IP connection. Please configure your Streambox Encoder as follows:

Settings	M4 Phone 64kbps	BGAN 128kbps	BGAN 256kbps	BGAN 256kbps - CIF
Target Bitrate	55kbps	110kbps	220kbps	220kbps
VBR Buffer Size	0.8s	0.8s	0.5s	0.8s
FEC	Off	Off	Off	Off
Video Resolution	QVGA	QVGA	QVGA	CIF
Color Profile	4:2:0	4:2:0	4:2:0	4:2:0
Closed Captions	Off	Off	Off	Off
Prefer Quality o/Frame Rate *	300/40	300/40	300/40	300/40
Frame rate	1/3	1/2	1/2	1/2
Change Key Frame	300	300	300	300
Min-Max Filter	Off	Off	Off	Off
Soft Filter	Off	Off	Off	Off
Overlapped DCT Filter *	On	On	On	On
De-interlace **	Off	Off	Off	Off
Swap Field Order	Off	Off	Off	Off
Monitor CPU Usage	Off	Off	Off	Off
Live Preview	Off	Off	Off	Off
Audio Codec	CELP	CELP	CELP	CELP
Audio Channels	Mono	Mono	Mono	Mono
Audio Capture Frequency	48000kHz	48000kHz	48000kHz	48000kHz

* - these options require progressive video. QVGA and CIF are progressive (half-field).
**-1/2…. D1 requires de-interlacing with (*)-options ON.

4. Open the Presets menu, and store the settings for your 256 Kbps BGAN connection.

5. Enter a destination IP address (Decoder or Server), in the Network menu. It is also recommended that you change the packet size to 1360 in the same menu.
6. Open a BGAN streaming IP connection using BGAN LaunchPad. The video will automatically stream to the Decoder (destination IP address). However, the local image will not get updated unless you select Live Preview from the Encoder's video menu.

NOTE: Make sure that you are using the correct broadcast standard for your camera. You can toggle between PAL, NTSC and NTSC-Japan. An inappropriate setting could result in black and white or scrolling video.

Setting up the IFB client

To set up Streambox IFB client:

1. Launch Streambox IFB Client.
2. To setup IFB Client for the first time:
   - Click on IFB Server button.
   - Type in the Server's IP address.
   - Type in a password (default password is **empty** word).
   - Click on **OK**.
3. Select the appropriate IFB channel to listen to audio. You can select additional audio devices, such as USB or Bluetooth, from the **Audio** menu. Audio devices/drives should be installed separately using Windows or Mac OSX standard procedures.

Setting up the client for Store and Forward broadcast

To set up the client for store and forward:

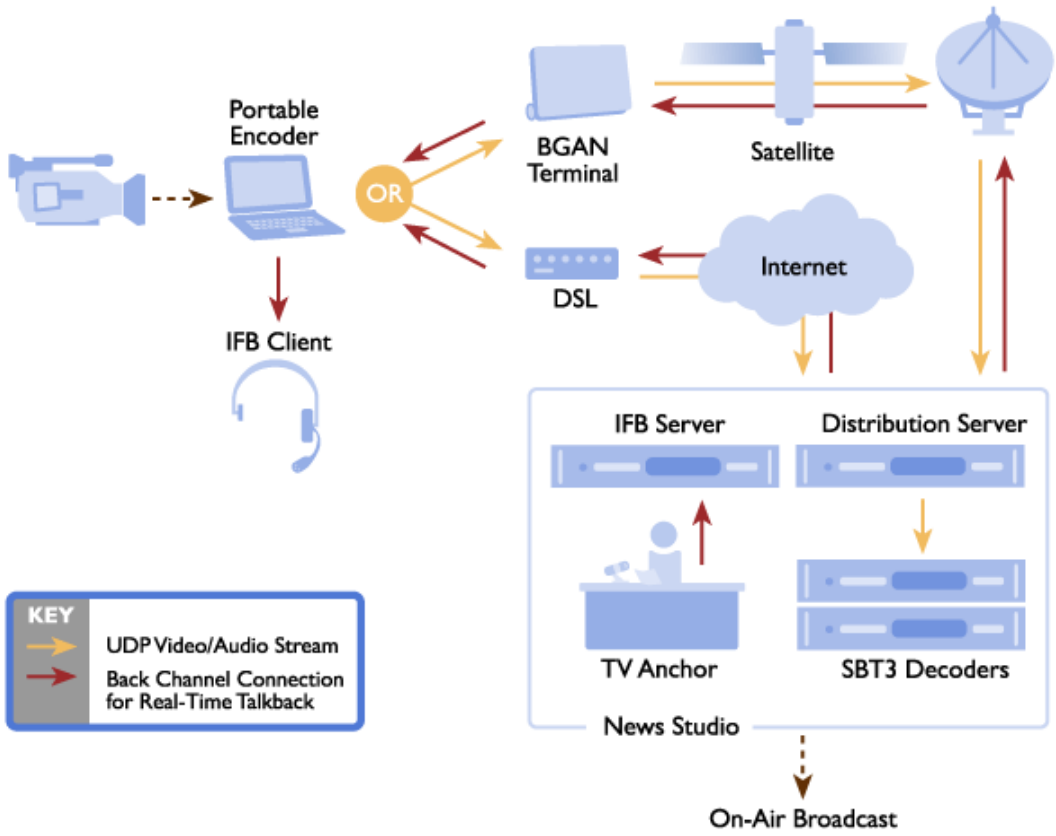
1. Select **Store to file** from the Encoder's **File** menu to start recording live video. You can use higher bandwidth than 256 Kbps for store and forward recording; usually 1 to 3 Mbps bandwidth is used for Full D1.
2. Click **Stop Recording** when the video is captured.
3. Open the Streambox File Transfer Tool (FTT).
4. Select **Remote Server IP** using the FTT interface.
5. Select **Recorded File**, and click **Upload** to start data transfer.
6. Once file is transferred, use **Playback Remote** to play out the video file.

Refer to the Streambox Store & Forward User Manual for details.

Setting up the server

The set up of the Streambox Distribution Server is beyond the scope of this document. Please note that video and audio is sent via the IP/UDP port. Usually, Streambox uses UDP port 1770 for direct streaming to the Decoder. The UDP port range 3700-5100 is used when streaming to the Distribution Server. This means that multiple Encoders can send video to a single IP, but to different port numbers. The Distribution server interface enables you to monitor which Encoder(s) are sending video, and to redirect to the appropriate Decoder(s). A user-friendly web interface is provided for this purpose.

Streambox ACT-L3 News Gathering Configuration



The camera connects to the Streambox Portable Encoder or SBT3-7500 Encoder. The video is captured, compressed, and transported using the Streambox ACT-L3 codec. The video stream is sent via a BGAN terminal and decoded by Streambox Decoders at the News Studio for On-Air Broadcast.

The Streambox Distribution Server is capable of receiving multiple streams from multiple BGAN terminals located at separate locations around the world, and of delivering video to several Streambox Decoders. The Streambox IFB Server is used to provide a real-time low latency talkback channel from studio to field reporters, using the BGAN back channel.

BGAN Customization

- Remember to switch off error correction using BGAN LaunchPad before you open a streaming IP data connection in BGAN LaunchPad.
- Use the 256kbps streaming IP data connection (if available) for the best video quality.

Technical Summary

The technical feature set for the Streambox ACT-L3 News Gathering solution is summarized below:

Feature	Streambox ACT-L3 for BGAN
Video Resolution	Vertical: NTSC 480i, PAL 576i
Frame Rate	Interlaced NTSC-29.97 fps (59.94 fields/sec) PAL 25i fps (50 fields/sec)
Streaming Rate	User selectable from 64 kbps to 9 Mbps

Audio Codecs	AAC, GSM, and CELP. Up to 64 Kbps per channel 44.1 or 48 KHz sampling rate
Audio Input	2-channel XLR or AES, 6-channel SDI (SMPTE-272M)
Closed Caption (Line 21)	Encoding, transmission
Video System	Time-Base Connection for analog video. Audio embedding
Video Inputs	Composite, SDI (SMPTE-259M)
Encoding Latency	Adjustable from 200 ms to 10 seconds
Video Post-Filtering	Advanced interlaced/progressive post filtering, including de-blocking, de-mosquito, and anti-aliasing
Video Pre-Filtering	Noise pre-filter, adjustable de-interlacing
Network Interfaces	Dual Ethernet
Network Protocol	Multicast/unicast UDP for IP
Setup and Control	Front access LCD panel and keypad, VGA output, USB ports
Forward Error Correction	Adjustable, 0% to 50%, Reed-Solomon, Parity, Shuffle
Options	Store and Forward
Operating System	Windows Pro
Dimensions	One encoder measuring 2.5in. x 12 in. x 13 in. (6.35 cm x 30.48 cm x 33.02 cm) + BNC length
Weight	9.8 lbs (4.45 kg)

Further details and support

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